Tenuazonic acid

Cat. No.: HY-N6715

CAS No.: 610-88-8

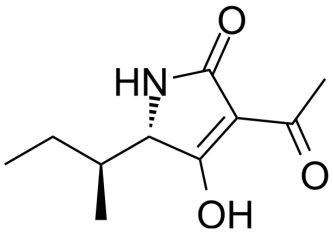
Molecular Formula: $C_{10}H_{15}NO_3$

Molecular Weight: 197.23

Target: Influenza Virus; Bacterial; Enterovirus; Photosystem II

Pathway: Anti-infection; Metabolic Enzyme/Protease

Storage: 4°C, protect from light
* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 50 mg/mL (253.51 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	5.0701 mL	25.3506 mL	50.7012 mL
	5 mM	1.0140 mL	5.0701 mL	10.1402 mL
	10 mM	0.5070 mL	2.5351 mL	5.0701 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 1.25 mg/mL (6.34 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 1.25 mg/mL (6.34 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 1.25 mg/mL (6.34 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Tenuazonic acid is a nonhost-selective mycotoxin belonging to the tetramic acids family. Tenuazonic acid inhibits protein biosynthesis on ribosomes by suppressing the release of new protein. Tenuazonic acid is acutely toxic, and oral LD_{50} is set between 81-186 mg/kg in rats and mice. Tenuazonic acid blocks electron transport beyond the primary quinone receptor (QA) by interacting with the D1 protein and is a ***photosystem II (PSII)*** inhibitor. In addition, Tenuazonic acid has antiviral effects on measles virus, enterovirus, respiratory virus and so on. Tenuazonic acid has an inhibitory effect on skin cancer[1][2][3][4][5][6][7].

IC_{50} & Target

ROS[4]

In Vitro	Tenuazonic acid (25 μg/ml; 24 h) regulates immune function through ROS production in leukocytes[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Tenuazonic acid (238-475 μg/kg; Oral administration/Intraperitoneal injection; 8 weeks) induces mycotoxicity in immunosuppressed mice[4]. Tenuazonic acid (125-500 μg; Topical application; Single dose) inhibits skin tumor in mice[5]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Cort-S (Hydrocortisone) (HY-N0583) treated swiss mice aged 3 months[4]
Dosage:	238 μg/kg; 475 μg/kg
Administration:	Intraperitoneal injection (i.p.); Oral administration (p.o.); 8 weeks
Result:	Caused hair loss and fatigue behavior in mice. Caused a notable decrease in feed intake and weight over the dosing weeks. Caused cysts and tumours in mice. Elevated malondialdehyde, reduced catalase and superoxide dismutase production, along with abnormal levels of aspartate aminotransferase and alanine transaminase.

Animal Model:	12-O-tetradecanoyl phorbol 13-acetate treated female Swiss albino mice (15 g)[5]
Dosage:	125, 250 and 500 μg
Administration:	Topical application; Single dose
Result:	Inhibited the ornithine decarboxylase (ODC) induction. Significantly decreased the cumulative number of tumors, reduced the percentage of tumor bearing animals and the rate of tumor growth. Did not have much effect on the average body weight of the mice.

REFERENCES

[1]. MILLER FA, et al. ANTIVIRAL ACTIVITY OF TENUAZONIC ACID. Nature. 1963 Dec 28;200:1338-9.

[2]. Kumari A, et al. Tenuazonic acid-induced mycotoxicosis in an immunosuppressed mouse model and its prophylaxis with cinnamaldehyde. Chemosphere. 2024 Sep;363:142812.

[3]. Antony M, et al. Inhibition of mouse skin tumor promotion by tenuazonic acid. Cancer Lett. 1991 Dec 9;61(1):21-5.

[4]. Yun CS, Motoyama T, Osada H. Biosynthesis of the mycotoxin tenuazonic acid by a fungal NRPS-PKS hybrid enzyme. Nat Commun. 2015 Oct 27;6:8758.

[5]. Gil-Serna J., et al. Encyclopedia of Food Microbiology. MYCOTOXINS | Toxicology. 2014 887–892.

[6]. Zhou B, et al. An evaluation of tenuazonic acid, a potential biobased herbicide in cotton. Pest Manag Sci. 2019 Mar 7.

[7]. Chen S, et al. Recent advances in tenuazonic acid as a potential herbicide. Pestic Biochem Physiol. 2017 Nov;143:252-257.

Caution: Product has not been fully validated for medical applications. For research use only.

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